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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,685	10/09/2001	Constantin C. Stancu	GP-300969	5761
7590	06/18/2004		EXAMINER	
CHRISTOPHER DEVRIES General Motors Corporation Legal Staff, Mail Code 482-C23-B21 P.O. Box 300 Detroit, MI 48265-3000			SCHEUERMANN, DAVID W	
		ART UNIT	PAPER NUMBER	2834

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/973,685	STANCU ET AL.	
	Examiner David W. Scheuermann	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 01 April 2004.
  - 2a) This action is FINAL.                    2b) This action is non-final.
  - 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.
- Disposition of Claims**
- 4) Claim(s) 1-4, 6 and 8-12 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
  - 5) Claim(s) \_\_\_\_\_ is/are allowed.
  - 6) Claim(s) 1-4, 6 and 8-12 is/are rejected.
  - 7) Claim(s) \_\_\_\_\_ is/are objected to.
  - 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 22 May 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All
  - b) Some \*
  - c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
  - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***PROSECUTION IS HEREBY REOPENED***

In view of the appeal brief filed on April 1, 2004, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-4, 6 and 8-12 have been considered but are moot in view of the new ground(s) of rejection. Furthermore the 112 rejection has been overcome by the applicant's assertion that the angle  $\beta$  may be varied to generate different values of d-axis current and q-axis current dependent on the requested torque by a computer program. Are these values generated at the time the

torque request is made or calculated before the request is made and implemented by a look-up table?

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4, 6 and 8-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Iijima et al., US 5936378. Iijima et al. show:

An electric motor control system comprising:

a stator (1U, 1V, and 1W; see figure 1) for producing a magnetic field;

a surface mount permanent magnet rotor rotated by said magnetic field;

a motor shaft (inherent) coupled to said rotor;

power electronics for controlling said magnetic field in said stator;

wherein said power electronics controls the q-axis and d-axis current components for the electric motor (control box 50 in figure 1); and

a controller controlling said power electronics (Gain Production Unit 40, figure 1), said controller including a control block to control the d-axis current as a function of the angle  $\beta$ .

In block 114, of figure 18 of Iijima et al. show that  $I_d$  is a function of the variable Gai. In column 16, lines 42 - 55, Gai is clearly defined as a function of the angle  $\beta$ , as

set forth on line 55. Since  $I_d$  is a function of  $G_{ai}$  and  $G_{ai}$  is a function of angle  $\beta$  it follows that  $I_d$  is also a function of angle  $\beta$ .

As to claim 4, note the inverter within control block 10 of figure 1.

Re claim 6, see block 118 of figure 18.

As to claim 9, official notice is taken that vector control drives are well known for their ability to control position, speed and torque in servo-systems.

Re claim 10,  $\beta$  is shown as the angle between the stator current vector with reference to the q-axis in figure 20. Also see figure 21, which inherently teaches the relationship between angle  $\beta$  and torque.

As to claim 11 and 12, note respective position sensor 3 and current sensor 2U.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima et al. in view of Carpenter et al., US 4642502. Iijima et al. disclose the invention substantially as claimed with respect to claim 1. Iijima et al. does not expressly disclose rare earth rotor magnets. Carpenter et al. disclose uses of rare earth rotor magnets, for the purpose of providing stronger magnets as described in column 3, lines 58-63. At the time the

invention was made, it would have been obvious to a person of ordinary skill in the art to use rare earth magnets on the rotor of Iijima et al. One of ordinary skill in the art would have been motivated to do this for any of providing stronger magnets to generate greater torque, saturating the iron core with a wider air gap, and making a lighter rotor to enable faster acceleration.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Birk et al. show angle  $\beta$  used in control block 18 to generate a signal which is used to generate both the d-axis and q-axis current.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David W. Scheuermann whose telephone number is (571) 272-2035. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached at (571) 272-2044. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1562.

dws  
June 9, 2004

DARREN SCHUBERG  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800